Optically-Switched Spin-Controlled Trapped Electrons for Speedy Floating Point Computation

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Introduction

Although great strides have been made in the area of unconventional processors capable of handling extremely large numbers and capable of mimicking neurological heuristic functions, technological progress in the area of facilitating large numbers of float-point calculations remain stagnant. Drawbacks of current floating-point-optimized technologies include the requirement for the use of large amounts of power and the generation of large amounts of waste heat.

Fundamentally, these problems have as their root the need for electrons to "flow" in order for computations to be performed. As electrons travel, they generate heat. Stationary electrons, however, do not generate heat.

Abstract

A processor capable of large numbers of floating point operations per second may be constructed on the basis of trapping a series of electrons in a series of electron traps. This may be termed an Electron Trap Line Array (ETLA.)

The system would consist of both electronic and optical components, however, single wavelengths of light would be used both for altering the spin direction of individual electrons as well as as a means for measuring the spin state of individual electrons or linear arrays of electrons.

A specialized electron trap allows for an electron to be both held in place and forced to spin in either one of two directions: One, in which North-over-South spin repeatedly brings the North pole of the electron to face upward and the other, which causes the North pole to never point upward. A single pulse of light directed at the wall of an individual electron trap from above is the actuation mechanism which forces a given electron to switch from top-down spin to left-right spin. When a light wave strikes the wall of this electron trap, the photons are converted into at least one electron and this electron, in order to reach a cathode, must travel around the circumference of the trap. This flow of energy has its own associated magnetic field which can be used to overcome the magnetic-aligning force of the electron trap and to bring about a switching in spin orientation without counteracting the van der Waals force which holds the electron within the trap and without ejecting the electron. A second set of LASER emitters then directs light in such a manner so as to skim the matrix whereas this light is used to measure the spin orientation of one or more electrons in a series.

If an individual electron is in the top-down mode of spin, its discrete magnetic field could be predicted to affect the angular momentum of individual photons skimming the matrix to an extent which is predictable. The position of photon

strike against a position-sensitive detector built into the walls of the processor; perhaps composed of rubidium-doped gold; could be used to measure which combination of nodes was in the top-down spin position. Because the discrete magnetic force generated by a single electron is a constant and because changes to the angular momentum caused by a given field would affect the proximity of passage to subsequent electrons, different combinations of spin positions at different aligned nodes would result in unique photon strike positions against the detector. The only limitation upon the number of aligned nodes would be the sensitivity and accuracy of measurements by the peripheral photon detector.

In order to enable this processing system, an optical processor linked to a series of LASER emitters would be needed in order to enable switching and data processing of sufficient speed to make use of the system's mode of operation.

The only places within the overall mechanism in which electrons come into play are in the electron traps, wherein the electrons are stationary and therefore do not generate heat and at the periphery, wherein photons are converted into electrons in order to assess the state of columns of trapped electrons. However, this peripheral detection mechanism could be purely optical as glass nanospheres could easily be used in order to accurately measure minute changes to the strike position of photons. As described in previous publications, tiny deviations to the entry point of a photon into a glass nanosphere result in much larger changes to photon position after it completes its passage. Multiple glass nanospheres may be used in conjunction with one-another in other to further elucidate differences in photon strike position which would otherwise be difficult to differentiate. These mechanisms have been termed by this author as *optical pulleys (*ibid..)

Regardless of how the strike position of photons is measured, the spin direction of individual, stationary electrons may be used in order to influence the path of light. It should be within the scope of the current state of the art to both trap electrons and to use photovoltaic convention events in order to trigger spin direction alternation within those traps.

Conclusion

The Electron Trap Linear Array allows for individual, stationary electrons to be used as transistors whereas glass nanospheres are used as both optical pulleys and as redirect junctions for light within an optical processor. This technology may serve well to fulfill the demand for unconventional processors capable of large numbers of floating point operations-per-second.